

### REMARKS

Favorable reconsideration of this application in view of the remarks to follow is respectfully requested. Since the present Response raises no new issues, and in any event, places the application in better condition for consideration on appeal, entry thereof is respectfully requested.

In the present Office Action, Claims 1-2, 14-22 and 24-57 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement. Specifically, it is alleged that the recitation in previously amended Claim 1 that the *precursor compound is not (C<sub>6</sub>H<sub>8</sub>)Ru(CO)<sub>3</sub>* is not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors, at the time the application was filed, had possession of the claimed feature.

In light of the §112 first paragraph rejection, applicants have removed the negative limitation from Claim 1. The removal of the negative limitation from Claim 1 obviates the rejection to Claims 1-2, 14-22 and 24-57 made under 35 U.S.C. §112, first paragraph. Thus, reconsideration and withdrawal of the instant rejection are thus respectfully requested.

In addition to removing the negative limitation from Claim 1, applicants have amended Claim 1 to positively recite that when the *precursor metal atom is Ru and said ligand is a carbonyl, then the precursor is selected from the group consisting of Ru<sub>3</sub>CO<sub>12</sub> and Ru<sub>3</sub>(CO)<sub>12</sub>*. Support for this amendment to Claim 1 can be found at Page 14, lines 3-6, and Page 29, lines 4-9 of the specification of the instant application.

Since the above amendment to Claim 1 does not introduce new matter into the specification entry thereof is respectfully requested. Applicants observe that the present amendment to Claim 1 eliminates (C<sub>6</sub>H<sub>8</sub>)Ru(CO)<sub>3</sub> as a possible precursor compound. Thus, the

amendment purposed in this Response does not raise any new issues and was, for all intended purposes, present in the previous Response of September 13, 2004.

In the previous Office Action dated June 18, 2004, Claims 1, 2, 14-22, 24-26, 28-32 and 39-40 were rejected under 35 U.S.C. §102(e) as allegedly anticipated by U.S. Patent No. 6,541,067 to Marsh, et al. ("Marsh, et al."). Claims 41-54 and 56 were rejected under 35 U.S.C. §103 as allegedly unpatentable over Marsh, et al. in view of U.S. Patent. No. 6,225,237 to Vaartstra ("Vaartstra")<sup>1</sup>. Claims 27 and 33-38 were rejected under 35 U.S.C. §103 as allegedly obvious over the combination of Marsh, et al. and U.S. Patent. No. 5,879,459 to Gadgil, et al. ("Gadgil, et al")<sup>1</sup>. Claim 55 was rejected under 35 U.S.C. §103(a) as allegedly obvious over the combination of Marsh, et al., Vaartstra and U.S. Patent. No. 5,688,028 to Bryant, et al. ("Bryant, et al").

Applicants observe that the foregoing rejections were not raised in the present Office Action because of the presence of the alleged new matter. Since applicants have removed the alleged new matter from the claims, applicants believe that the rejections raised in the previous Office Action might be applicable for the claims now pending. For completeness, and to avoid receiving further Office Actions, applicants submit the following comments thereon.

Turning to the rejection under 35 U.S.C. §102, it is axiomatic that anticipation under §102 requires the prior art reference to disclose every element to which it is applied. *In re King*, 801 F.2d 1324, 1326, 231 USPQ 36, 138 (Fed Cir, 1986). Thus, there must be no differences between the subject matter of the claim and the disclosure of the prior art reference. Stated another way, the reference must contain within its four corners adequate direction to practice the invention as claimed. The corollary of the rule is equally applicable: absence from the applied

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1 Applicants observe that in previous Office Action it appears that the Examiner meant to cite Marsh, et al. as the principal reference. Hence, Applicants remarks include Marsh, et al. in the § 103 rejections citing Vaarstra and Gadgil, et al.

reference of any claimed element negates anticipation. *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1571, 230 USPQ 81, 84 (Fed. Cir. 1986).

Marsh, et al. fail do not anticipate applicants' claimed precursor source mixture utilized for chemical vapor deposition or atomic layer deposition since the applied reference does not disclose a precursor source mixture utilized for chemical vapor deposition or atomic layer deposition comprising at least one precursor compound which is dissolved, emulsified or suspended in an inert organic liquid, where the precursor compound is a precursor metal atom bound to a ligand selected from the group consisting of hydride, carbonyl, imido, hydrazido, phosphido, nitrosyl, nitril, nitrate, nitrile, halide, azide, siloxy, and silyl, with the proviso that *when the precursor metal atom is Ru and said ligand is a carbonyl, then the precursor is selected from the group consisting of  $Ru_3CO_{12}$  and  $Ru_3(CO)_{12}$ .*

Marsh, et al. disclose a method directed to forming a film of ruthenium or ruthenium oxide to the surface of a substrate by employing the techniques of chemical vapor deposition to decompose ruthenium precursor formulations. Referring to Column 7, lines 10-65, the precursor disclosed in Marsh, et al. comprises  $(C_6H_5)_3Ru(CO)_3$  prepared by mixing 10 grams of  $Ru_3(CO)_{12}$  with 30 mls of benzene and 13.5 ml of 1,3-cyclohexadiene. Applicants have amended Claim 1 to state that the ruthenium (Ru) carbonyls are selected from  $Ru_3CO_{12}$  and  $Ru_3(CO)_{12}$ ;  $(C_6H_5)_3Ru(CO)_3$  is not included within the recited Ru carbonyls presently claimed.

The foregoing remarks clearly demonstrate that Marsh, et al. do not teach each and every aspect of the claimed invention as required by *King* and *Kloster Speedsteel; et al.*, therefore the claims of the present application are not anticipated by the disclosure of Marsh, et al. In view of the above amendments and remarks, the §102 rejection to Claims 1, 2, 14-22, 24-26, 28-32 and 39-40 citing Marsh, et al. has been obviated. Reconsideration and withdrawal thereof are respectfully requested.

Turning to the rejection of Claims 41-54 and 56 under 35 U.S.C. §103, applicants submit that the combination of Marsh, et al. and Vaartstra does not render applicants' claimed method obvious, since the applied prior art fails to teach or suggest the use of the claimed precursor compounds that are now recited in Claim 1.

Applicants submit that Marsh, et al. fail to render applicants' claimed invention, as recited in Claims 41-54 and 56, unpatentable for the same reason that the applied reference failed to anticipate applicants' claimed invention. Therefore, applicants respectfully submit that the above remarks concerning the anticipation rejection, apply equally well to the obviousness rejection of Claims 41-54, and 56. To reiterate, Marsh, et al. fail to teach or suggest a precursor source mixture utilized for chemical vapor deposition or atomic layer deposition comprising at least one precursor compound as recited in amended Claim 1. In the claimed invention, the Ru carbonyls are limited to  $Ru_3CO_{12}$  or  $Ru_3(CO)_{12}$ . Marsh, et al. utilize  $(C_6H_5)_3Ru(CO)_3$  which compound is not included within the claimed list of Ru carbonyls.

Vaartstra does not alleviate the deficiencies in the primary reference, Marsh, et al., since the applied secondary reference also fails to teach or suggest applicants' claimed precursor source mixture including applicants' claimed precursor compound, as recited in amended Claim 1. Applicants observe that Vaartstra is relied upon for disclosing known semiconducting structures, such as capacitors, field effect transistors and wiring structures and submit that Vaartstra is far removed from applicants' claimed precursor compositions.

Vaartstra discloses a method of forming a film on a substrate using one or more complexes containing one or more chelating O- and/or N-donor ligands. More specifically, Vaartstra discloses a method of forming a film on a substrate using one or more complexes containing  $RC(O)NC(O)CR$  diacetamido,  $RC(NH)NC(NH)CR$  imidoamidinato, or  $RC(O)NC(N)CR$  ligands. Claim 1 had been previously amended to exclude precursors bound to

RC(O)NC(O)CR diacetamido, RC(NH)NC(NH)CR imidoylamidinato, or RC(O)NC(N)CR ligands, wherein R is a hydrocarbon. In view of the above amendments and remarks, the rejection to Claims 41-54, and 56 citing the combination of Marsh, et al. and Vaartstra has been obviated.

Turning to the §103 rejection of Claims 27, and 33-38 citing the combination of Marsh, et al., and Gadgil, et al., applicants' respectfully submit that the combination of the applied prior art fails to render applicants' invention unpatentable, since the applied combination fails to teach or suggest applicants' claimed precursor source mixture, as recited in amended Claim 1. As discussed above, Marsh, et al. fail to teach or suggest on of applicants' claimed precursor compounds. Gadgil, et al. do not alleviate the defects in Marsh, et al., since Gadgil, et al. also fail to teach or suggest applicants' claimed precursor compounds. Gadgil, et al. disclose a low profile, compact atomic layer deposition reactor having a low profile body with a substrate processing region adapted to serve a single substrate or a planar array of substrates, and a valved load and unload port for substrate loading and unloading. Applicants submit that Gadgil, et al. are far removed from applicants' claimed invention and find no motivation in Gadgil, et al. that would lead one to replace elements of the prior art with one of the presently claimed precursor compounds. In view of the above amendments and remarks, the rejection to Claims 27 and 33-38 citing the combined disclosures of Marsh, et al., and Gadgil, et al. has been obviated. Therefore, applicants respectfully request that the §103 rejection of Claims 27 and 33-38 be withdrawn.

Turning to the rejection of Claim 55 under 35 U.S.C. §103 over the combination of Vaartstra, Marsh, et al., and Bryant, et al., applicants respectfully submit that Bryant, et al. also fail to teach or suggest one of applicants' claimed precursor compositions, as recited in amended Claim 1. Bryant, et al. disclose a gate structure in a transistor and a method for fabricating the

gate structure in a transistor. Applicants respectfully submit that in light of the above remarks and amendments the present rejection has been obviated. Therefore, applicants respectfully request that the rejection of Claim 55 under §103 be withdrawn.

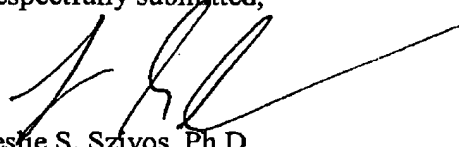
The §103 rejections also fail because there is no motivation in the applied references, which suggests modifying the metal precursor compounds to include applicants' claimed precursor composition. This rejection is thus improper since the prior art does not suggest this drastic modification. The law requires that a prior art reference provide some teaching, suggestion, or motivation to make the modification obvious.

Here, there is no motivation provided in the disclosures of the applied prior art reference, or otherwise of record, which would lead one skilled in the art to make the modification mentioned hereinabove. "The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the desirability of the modification." In re Fritch, 972 F.2d, 1260,1266, 23 USPQ 1780,1783-84 (Fed. Cir. 1992).

There is no suggestion in the prior art of applicants' claimed metal precursor compound as recited in amended Claim 1, therefore all the claims of the present application are not obvious from the prior art applied in the present Office Action. Based on the above amendments and remarks, each of the §103 rejection has been obviated; therefore reconsideration and withdrawal of the instant §103 rejections are respectfully requested.

Thus, in view of the foregoing amendments and remarks, it is firmly believed that the present case is in condition for allowance, which action is earnestly solicited.

Respectfully submitted,



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